WHAT IS CLAIMED IS:

1. A bearing test method to test, in a bearing that can retain a shaft element and a bearing element coaxially positioned in a non-contact state when the number of revolutions exceeds a predetermined number of relative revolutions, whether the shaft element and the bearing element are in a contact rotation state, the method comprising the steps of:

relatively rotating the shaft element and the bearing element;

detecting a change in impedance between the shaft element and the bearing element in the relative rotation state,

determining, based on the change in impedance, whether the shaft element and the bearing element are in a contact rotation state.

2. A bearing test method according to claim 1, wherein a resistance change or a capacitance change, or both is detected in a state when the shaft element and the bearing element are relatively rotating.

3. A bearing test method according to claim 1, wherein the impedance change is detected while the number of relative revolutions between the shaft element and the bearing element is varied, and based on a detected impedance change, the number of relative revolutions is detected when the shaft element and the bearing element switch from a contact rotation state to a non-contact rotation state, or from a non-contact rotation state to a contact rotation state.

4. A bearing test method according to claim 3, wherein the number of relative revolutions is increased from zero, and the number of relative revolutions is detected as the number of floating rotation when the shaft

element and the bearing element switch from a contact rotation state to a non-contact rotation state.

5. A bearing test method according to claim 3, wherein the number of relative revolutions is decreased, and the number of relative revolutions is detected as the number of contact rotation when the shaft element and the bearing element switch from a non-contact rotation state to a contact rotation state.

6. A bearing test method according to claim 1, wherein whether the shaft element and the bearing element are in an abnormal contact rotation state is determined based on the impedance change.

7. A bearing test method according to claim 6, wherein, when the number of relative revolutions is constant and when the impedance change occurs in an irregular manner, a determination is made that the abnormal contact rotation state is caused by a foreign matter that is contaminated in the gap between the shaft element and the bearing element.

8. A bearing test method according to claim 6, wherein, when the number of relative revolutions is constant and impedance changes occur cyclically, a determination is made that the abnormal contact rotation state is caused either by the shaft element or the bearing element itself or by a foreign matter rotating synchronously with the shaft element or the bearing element.

9. A bearing test method according to claim 1, wherein the impedance change is detected in a non-contact manner with respect to the shaft element or the bearing element.

10. A bearing test method according to claim 1, wherein the bearing is a dynamic pressure bearing that includes grooves for generating a dynamic pressure by a fluid between the shaft element and the bearing element.

11. A bearing test method according to claim 1, wherein the bearing is a bearing for a revolving- armature in which a rotor of the revolving-armature is rotatably supported with respect to a stator.

12. A bearing test device for testing a bearing that can retain a shaft element and a bearing element coaxially positioned in a non-contact state when the number of revolutions exceeds a predetermined number of relative revolutions, whether the shaft element and the bearing element are in a contact rotation state, the bearing test device comprising:

an impedance detection circuit that detects impedance that changes with the contact or non-contact state between the shaft element and the bearing element in a relative rotation state,

wherein the impedance detection circuit is equipped with a voltage application device that applies voltage to one of the shaft element and the bearing element, and an output voltage detection device that detects output voltage from the other, and

a determination is made based on a change in the output voltage as to whether the shaft element and the bearing element are in a contact rotation state.

13. A bearing test device according to claim 12, wherein the voltage application device is an alternating voltage application device that applies alternating voltage.

14. A bearing test device according to claim 13, wherein the alternating voltage application device comprises an excitation electrode placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and

the output voltage detection device comprises a detection electrode placed in close proximity to the other of the shaft element and the bearing element, and an output voltage detector that detects output voltage provided as output by the detection electrode.

15. A bearing test device according to claim 14, wherein each of the excitation electrode and the detection electrode is a ring type or a cylinder type.

16. A bearing test device according to claim 13, wherein the impedance detection circuit is a LC resonant circuit with an inductor serially connected between the detection electrode and the ground.

17. A bearing test device according to claim 16, wherein the frequency of the alternating voltage to be applied is a LC resonant frequency.

18. A bearing test device according to claim 17, wherein the LC resonant frequency is obtained by monitoring in advance output voltage waveform observed in contact and non-contact states, and selecting a frequency as the LC resonant frequency when the output voltage waveform has the maximum amplitude.

19. A bearing test device according to claim 13, wherein the alternating voltage application device comprises an excitation electrode

placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, wherein

the output voltage detection device comprises a detection electrode that detects voltages on both ends of a resistance serially connected between the excitation electrode and the alternating voltage source.

20. A bearing test device according to claim 12, wherein the output voltage detection device comprises a waveform conversion circuit that converts the waveform of the detected output voltage.

21. A bearing test device according to claim 12, wherein the bearing is a dynamic pressure bearing that includes grooves for generating a dynamic pressure by a fluid between the shaft element and the bearing element.

22. A bearing test device according to claim 21, wherein the bearing is a bearing in which a rotor of a hard disk driving motor is rotatably supported with respect to a stator of the hard disk driving motor.

23. A bearing test device according to claim 22, wherein the hard disk driving motor comprises a base plate, and a disk hub for mounting a hard disk thereon, wherein a sleeve as the bearing element is formed in the base plate, and a rotor shaft as the shaft element is provided in the center of the disk hub.

24. A bearing test device according to claim 23, wherein the voltage application device comprises an excitation electrode placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode,

and the hard disk driving motor comprises a motor case that is disposed in close proximity to the base plate or the disk hub, and the motor case is used as the excitation electrode or the detection electrode.

25. A bearing test device according to claim 23, wherein the base plate is provided with a counter plate as the bearing element that forms a dynamic pressure thrust bearing between end faces of the rotor shaft and the base plate,

wherein the counter plate is electrically insulated from the base plate and used as the excitation electrode or the detection electrode.

26. A bearing test device according to claim 23, wherein the hard disk driving motor comprises a base plate, and a disk hub for mounting a hard disk thereon, wherein a shaft as the shaft element is affixed to the base plate, and a sleeve as the bearing element is formed in the disk hub.

27. A bearing test device according to claim 26, wherein the voltage application device comprises an excitation electrode placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and the hard disk driving motor comprises a motor case that is disposed in close proximity to the base plate or the disk hub, and the motor case is used as the excitation electrode or the detection electrode.

28. A motor bearing monitoring device comprising:

a status detection device that detects the state of a motor bearing;

an abnormality determination device that makes a determination whether the bearing is in an abnormal state based on the state of the bearing as detected by the status detection device; and

an output device that outputs a result of the determination from the abnormality determination device.

29. A motor bearing monitoring device according to claim 28, wherein the status detection device is an impedance detection device that detects impedance of the bearing.

30. A motor bearing monitoring device according to claim 29, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, and the abnormality determination device, based on a change in impedance, determines a point at which the bearing switches from a contact rotation state to a non-contact rotation state when the motor starts, and determines that there is an abnormality with the bearing when the number of motor revolutions at that point exceeds a predetermined number of float revolutions.

31. A motor bearing monitoring device according to claim 29, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, and the abnormality determination device, based on a change in impedance, determines whether the bearing is in a contact rotation state when the motor is in a steady rotation state, and determines that there is an abnormality with the bearing when the bearing is in a contact rotation state or when a momentary contact rotation state occurs repeatedly.

32. A motor bearing monitoring device according to claim 29, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions,

and the abnormality determination device, based on a change in impedance, determines a point at which the bearing switches from a non-contact rotation state to a contact rotation state when the motor is stopping, and determines that there is an abnormality with the bearing when the number of motor revolutions at that point exceeds a predetermined number of contact revolutions.

33. A motor bearing monitoring device according to claim 29, wherein the impedance detection device comprises a voltage application device that applies alternating voltage to one of a first bearing element and a second bearing element that rotate relatively in a contact rotation state or non-contact rotation state, and an output voltage detection device that detects output voltage from the other, and

wherein the abnormality determination device, based on a change in the output voltage, determines whether the first and second bearing elements are in a contact rotation state.

34. A motor bearing monitoring device according to claim 33, wherein the voltage application device is an alternating voltage application device that applies alternating voltage.

35. A motor bearing monitoring device according to claim 34, wherein the alternating voltage application device comprises an excitation electrode placed in close proximity to one of the first bearing element and the second bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and

wherein the output voltage detection device comprises a detection electrode placed in close proximity to the other of the bearing elements, and

an output voltage detector that detects output voltage provided as output by the detection electrode.

36. A motor bearing monitoring device according to claim 35, wherein each of the excitation electrode and the detection electrode is a ring type or a cylinder type.

37. A motor bearing monitoring device according to claim 35, wherein the impedance detection circuit is a LC resonant circuit with an inductor serially connected between the detection electrode and the ground.

38. A motor bearing monitoring device according to claim 37, wherein the frequency of the alternating voltage to be applied is a LC resonant frequency.

39. A motor bearing monitoring device according to claim 38, wherein the LC resonant frequency is obtained by monitoring in advance output voltage waveform observed in contact and non-contact states, and adjusting a frequency such that the output voltage waveform has the maximum amplitude.

40. A motor bearing monitoring device according to claim 33, wherein the abnormality determination device comprises a waveform conversion circuit that converts an output voltage waveform that is detected by the output voltage detection device.

41. A motor bearing monitoring device according to claim 33, wherein the bearing is a dynamic pressure bearing in which a rotor of a hard

disk driving motor is rotatably supported with respect to a stator of the hard disk driving motor.

42. A motor bearing monitoring device according to claim 41, wherein the hard disk driving motor comprises a base plate, and a disk hub for mounting a hard disk thereon, wherein a sleeve as one of the first and second bearing elements is formed in the base plate, and a rotor shaft as the other of the bearing elements is provided in the center of the disk hub.

43. A motor bearing monitoring device according to claim 42, wherein the voltage application device comprises an excitation electrode placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and the hard disk driving motor comprises a motor case that is disposed in close proximity to the base plate or the disk hub, and the motor case is used as the excitation electrode or the detection electrode.

44. A motor bearing monitoring device according to claim 43, wherein the base plate is provided with a counter plate as a bearing element that forms a dynamic pressure thrust bearing between the rotor shaft and the base plate,

wherein the counter plate is electrically insulated from the base plate and used as the excitation electrode or the detection electrode.

45. A motor bearing monitoring device according to claim 41, wherein the hard disk driving motor comprises a base plate, and a disk hub for mounting a hard disk thereon, wherein a shaft as one of the first and second bearing elements is affixed to the base plate, and a sleeve as the other of the bearing elements is formed in the center of the disk hub.

46. A motor bearing monitoring device according to claim 45, wherein the voltage application device comprises an excitation electrode placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and the hard disk driving motor comprises a motor case that is disposed in close proximity to the base plate or the disk hub, and the motor case is used as the excitation electrode or the detection electrode.

47. A motor bearing monitoring device according to claim 45, wherein the alternating voltage application device comprises an excitation electrode placed in close proximity to one of the first and second bearing elements and an alternating voltage source that applies alternating voltage to the excitation electrode, and

the output voltage detection device is a voltage detector that detects voltages at both ends of a resistance serially connected between the excitation electrode and the alternating voltage source.

48. A motor bearing monitoring device according to claim 28, wherein the status detection device is an acoustic sensor that detects acoustics generated by the bearing.

49. A motor bearing monitoring device according to claim 48, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, and the abnormality determination device, based on an output from the acoustic sensor, determines whether the bearing is in a contact rotation state when the motor is in a steady rotation state, and determines that there is an

abnormality with the bearing when the bearing is in a contact rotation state or when a momentary contact rotation state occurs repeatedly.

50. A motor bearing monitoring device according to claim 48, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, and the abnormality determination device, based on an output from the acoustic sensor, determines a point at which the bearing switches from a non-contact rotation state to a contact rotation state when the motor is stopped when the motor is in a steady rotation state, and determines that there is an abnormality with the bearing when the number of motor revolutions at that point exceeds a predetermined number of contact revolutions.

51. A motor bearing monitoring device according to claim 28, wherein the status detection device is a temperature sensor that detects the temperature of the bearing.

52. A motor bearing monitoring device according to claim 28, wherein the abnormality determination device determines whether the bearing is near an end of service life thereof.

53. A motor bearing monitoring device according to claim 28, wherein the output device is a display device, a speaker, or a buzzer.

54. A memory device having a disk-shaped memory media, a disk driving motor that rotationally drives the memory media, and a head device that performs at least one of two operations that are recording information on or retrieving information from the memory media, the memory device comprising:

a status detection device that detects the status of a bearing of the disk driving motor;

an abnormality determination device that makes a determination as to whether the bearing is in an abnormal state based on the state of the bearing as detected by the status detection device; and

an output device that outputs a result of the determination from the abnormality determination device.

55. A memory device according to claim 54, wherein, when the abnormality determination device determines that there is an abnormality with the bearing, the output device provides as output information that the bearing's life is near its end and instructs to store the memory in the recording media in another memory medium.

56. A memory device according to claim 54, further comprising an auxiliary recording medium for backup purposes and onto which contents recorded on the recording media is writable when there is an abnormality with the bearing.

57. A memory device according to claim 56, further comprising a backup device that writes contents recorded on the memory medium onto the auxiliary recording medium when the abnormality determination device determines that there is an abnormality with the bearing.

58. A memory device according to claim 54, further comprising a motor stopping device that forcefully stops the rotation of the motor when the abnormality determination device determines that there is an abnormality with the bearing.

59. A memory device according to claim 54, wherein the status detection device is an impedance detection device that detects impedance of the bearing.

60. A memory device according to claim 59, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, and the abnormality determination device, based on a change in impedance, determines a point at which the bearing switches from a contact rotation state to a non-contact rotation state when the motor starts, and determines that there is an abnormality with the bearing when the number of motor revolutions at that point exceeds a predetermined number of float revolutions.

61. A memory device according to claim 59, wherein the bearing wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, and the abnormality determination device, based on a change in impedance, determines whether the bearing is in a contact rotation state when the motor is in a steady rotation state, and determines that there is an abnormality with the bearing when the bearing is in a contact rotation state or when a momentary contact rotation state occurs repeatedly.

62. A memory device according to claim 61, wherein the status detection and the abnormal judgment for the bearing are conducted at predetermined time intervals.

63. A memory device according to claim 61, wherein the status detection and the abnormal judgment for the bearing are conducted when the

head device does not perform a recording operation or a reproducing operation with the memory medium.

64. A memory device according to claim 59, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, wherein the abnormality determination device, based on a change in the impedance, determines a point at which the bearing switches from a non-contact rotation state to a contact rotation state when the motor is stopped, and determines that there is an abnormality with the bearing when the number of motor revolutions at that point exceeds a predetermined number of contact revolutions.

65. A memory device according to claim 54, wherein the status detection device is an acoustic sensor that detects acoustics generated by the bearing.

66. A motor bearing monitoring device according to claim 65, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, wherein the abnormality determination device, based on an output from the acoustic sensor, determines whether the bearing is in a contact rotation state when the motor is in a steady rotation state, and determines that there is an abnormality with the bearing when the bearing is in a contact rotation state or when a momentary contact rotation state occurs repeatedly.

67. A memory device according to claim 66, wherein the status detection and the abnormal judgment for the bearing when the motor is in a steady rotation state are conducted at predetermined time intervals.

68. A memory device according to claim 66, wherein the status detection and the abnormal judgment for the bearing when the motor is in a steady rotation state are conducted when the head device does not perform a recording operation or a reproducing operation with the memory medium.

69. A memory device according to claim 65, wherein the bearing forms a non-contact rotation state via a fluid film when the number of revolutions exceeds a predetermined number of revolutions, wherein the abnormality determination device, based on an output from the acoustic sensor, determines a point at which the bearing switches from a non-contact rotation state to a contact rotation state when the motor is stopping, and determines that there is an abnormality with the bearing when the number of motor revolutions at that point exceeds a predetermined number of contact revolutions.

70. A memory device according to claim 54, wherein the status detection device is a temperature sensor that detects temperatures of the bearing.

71. A memory device according to claim 54, wherein the status detection device is a retry number detection device that detects the number of retry attempts made by the head device to record on or retrieve from the recording media,

the abnormality determination device calculates an average number of retry attempts made in a given amount of time based upon the number of detected retry attempts made, and determines that there is an abnormality with the bearing if the average number of retry attempts made exceeds a predetermined number.

72. A memory device according to claim 59, wherein the output device is a display device or a speaker.

73. A memory device according to claim 59, wherein the impedance detection device comprises a voltage application device that applies alternating voltage to one of a first bearing element and a second bearing element that rotate relatively in a contact rotation state or non-contact rotation state, and an output voltage detection device that detects output voltage from the other, and

wherein the abnormality determination device, based on a change in the output voltage, determines whether the first and second shaft bearing are in a contact rotation state.

74. A memory device according to claim 73, wherein the alternating voltage application device comprises an excitation electrode placed in close proximity to one of the first bearing element and the second bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and

the output voltage detection device comprises a detection electrode placed in close proximity to the other of the bearing elements, and an output voltage detector that detects output voltage provided as output by the detection electrode.

75. A memory device according to claim 74, wherein the impedance detection circuit is a LC resonant circuit with an inductor serially connected between the detection electrode and the ground.

76. A memory device according to claim 73, wherein the alternating voltage application device comprises an excitation electrode placed in close proximity to one of the first and second bearing elements and an alternating voltage source that applies alternating voltage to the excitation electrode, and

the output voltage detection device is a voltage detector that detects voltages at both ends of a resistance serially connected between the excitation electrode and the alternating voltage source.

77. A memory device according to claim 73, wherein the abnormality determination device comprises a waveform conversion circuit that converts an output voltage waveform that is detected by the output voltage detection device.

78. A memory device according to claim 73, wherein the bearing is a dynamic pressure bearing.

79. A memory device according to claim 76, wherein the disk driving motor comprises a base plate, and a disk hub for mounting the memory medium thereon, wherein a sleeve as one of the first and second bearing elements is formed on the base plate, and a rotor shaft as the other of the bearing elements is formed in the center of the disk hub.

80. A memory device according to claim 77, wherein the voltage application device comprises an excitation electrode placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and the disk driving motor comprises a motor case that is disposed in close

proximity to the base plate or the disk hub, and the motor case is used as the excitation electrode or the detection electrode.

81. A memory device according to claim 77, wherein the voltage application device comprises an excitation electrode placed in close proximity to one of the shaft element and the bearing element and an alternating voltage source that applies alternating voltage to the excitation electrode, and the base plate is provided with a counter plate as the bearing element that forms a dynamic pressure thrust bearing between end faces of the rotor shaft and the base plate,

wherein the counter plate is electrically insulated from the base plate and used as the excitation electrode or the detection electrode.